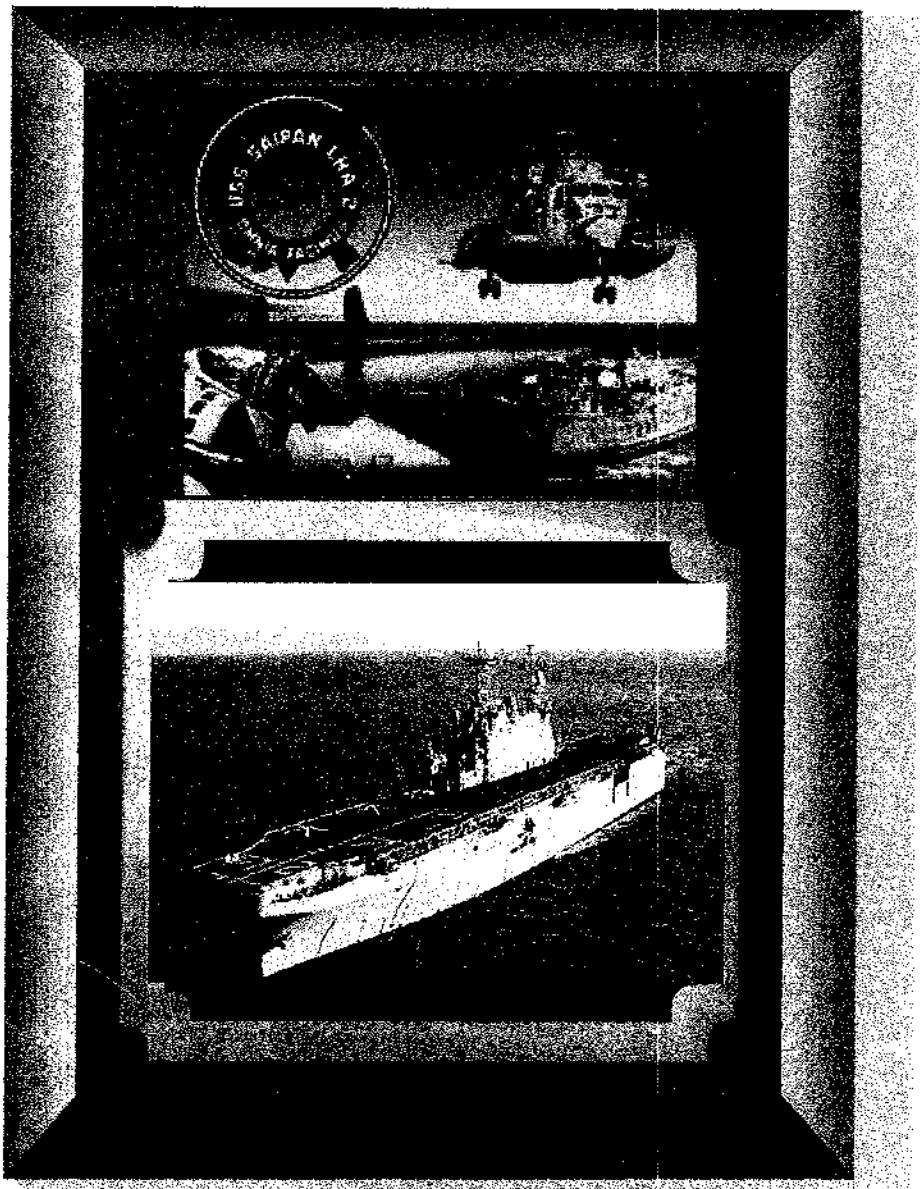
USS SAIPAN (LHA-2)
PIPING SYSTEM
ULTRASONIC TESTING



NAVSEA
PORTSMOUTH
Supervisor of Shipbuilding

ULTRASONIC TESTING PLAN/BOOK CONTENTS:

1. SUMMARY OF FINDINGS/RESULTS.

2. PIPE CLOCK POSITION DIAGRAM.

3. PIPING SYSTEM ULTRASONIC TESTING GENERAL INFORMATION.

4. SNAPSHOT INSPECTION PROCEDURE FOR ULTRASONIC TESTING OF PIPING.

5. ULTRASONIC TEST PLAN, PIPING (MEASUREMENT POINT DIAGRAMS/DRAWINGS SKETCHES AND DATA SHEETS) FOR THE FORWARD AND AFT MAIN MACHINERY ROOMS BELOW THE DECKPLATE LEVEL (INNER BOTTOM/BILGE) FOR THE FOLLOWING PIPING SYSTEMS:

   A. LOW PRESSURE STEAM DRAIN.

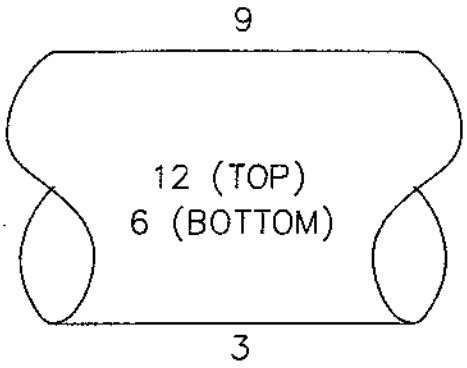
   B. HIGH PRESSURE STEAM DRAIN.

   C. LUBE OIL PURIFING AND TRANSFER SYSTEMS.

NOTE: SOME MEASUREMENT POINTS ON THE DIAGRAMS, DRAWINGS OR SKETCHES MAY BE INACCESSIBLE OR UNSUITABLE FOR TAKING MEASUREMENTS: REFER TO PARAGRAPHS 3 AND 4 IN 3 ABOVE FOR SPECIAL NOTES WHERE MEASUREMENTS CONNOT BE TAKEN.

VIEW ORIENTATIONS

VIEW "A"

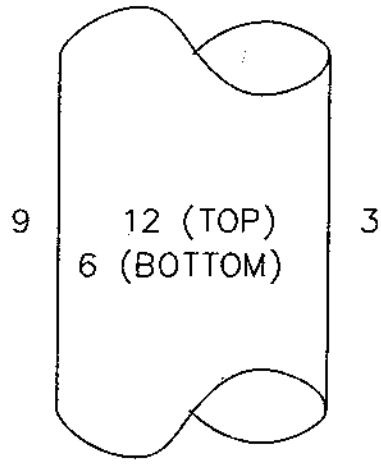


FORWARD

(TOP VIEW LOOKING DOWN)

FORWARD/AFT PIPE RUN

VIEW "B"



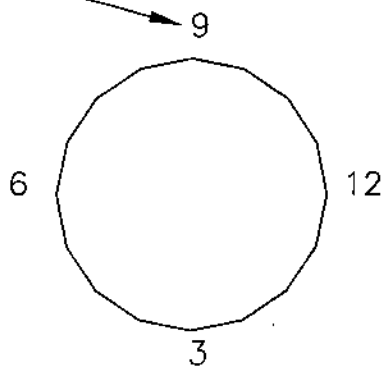
FORWARD

(TOP VIEW LOOKING DOWN)

PORT/STARBOARD PIPE RUN

CLOCK POSITION (TYPICAL)

VIEW "C"



FORWARD

(TOP VIEW LOOKING DOWN)

UP/DN PIPE RUN

PIPING SYSTEM ULTRASONIC TESTING GENERAL INFORMATION

1. FOR MOST PIPING SYSTEMS, WHETHER LAGGED OR NOT, ONE MEASUREMENT, PREFERABLY AT 6 O'CLOCK, WHEN POSSIBLE, SHOULD BE TAKEN UNLESS THE PIPING OR READINGS ARE SUSPECT, IN WHICH CASE ADDITIONAL READINGS SHOULD BE TAKEN. UNDER THESE CIRCUMSTANCES, OR FOR CHT PIPING, 4 READINGS "AROUND THE CLOCK" ARE DESIRABLE, WHEN POSSIBLE.

2. MEASUREMENTS INVOLVING LAGGED PIPING REQUIRE A "V" SHAPED CUT TO CREATE A FLAP TO GAIN ACCESS TO THE PIPE SURFACE WITH THE PROBE. AFTER THE MEASUREMENT IS TAKEN, THE FLAP SHOULD BE TUCKED BACK INTO PLACE, AND IN HIGHLY VISABLE AREAS (E.G. PASSAGEWAYS AND BERTHING AREAS) COVERED WITH A STRIP OF ADHEASIVE LAGGING PATCH, IF AVAILABLE. ONE MEASUREMENT/LAGGING CUT SHOULD BE TAKEN, UNLESS CLOSE PROXIMITY OF FITTINGS, SURFACE IRREGULARITEIS, OR SUSPECT READINGS REQUIRE ADDITIONAL CUT IN THE LAGGING IN CLOSE PROXIMITY TO OBTAIN A VALID READING.

3. IN SOME CASES, AN ACCURATE MEASUREMENT CANNOT BE MADE AT A DESIGNATED MEASURMENT POINT AT ANY CLOCK POSITION DUE TO SURFACE IRREGULARITIES (SEE NOTE 1 AT BOTTOM OF DATA SHEETS), OR DUE TO INACCESSABILITY/LOCATION OF THE PIPE (SEE NOTE 2 AT BOTTOM OF DATA SHEETS), OR DUE TO CLOSE PROXIMITY OF PIPE FITTINGS (SEE NOTE 3 AT BOTTOM OF DATA SHEETS); IN THESE INSTANCES, "NOTE 1", "NOTE 2" OR "NOTE 3" SHOULD BE WRITTEN IN ALL FOUR SPACES FOR THAT MEASUREMENT POINT.

4. IN ISOLATED CASES, MEASUREMENTS CANNOT BE TAKEN BECAUSE A MEASUREMENT POINT EITHER NO LONGER EXISTS OR IS NO LONGER RELEVANT BECAUSE THE PIPE HAS BEEN CAPPED AT THAT POINT, IN WHICH CASE "CAPPED" SHOULD BE WRITTEN IN ALL FOUR SPACES FOR THAT MEASUREMENT POINT. SIMILARLY, USUALLY ON THE WEATHER DECK AND INVOLVING "CHT" PIPING, A FEW MEASUREMENT POINTS MAY BE COVERED WITH PASSIVE COUNTERMEASURE SYSTEM (PCMS) MATERIAL; DO NOT CUT THIS MATERIAL; ENTER "PCMS" IN THE FOUR DATA BLOCKS FOR THESE MEASUREMENT POINTS.

5. AT TIMES, UNEVEN, LAYERED OR BLISTERED PAINT ON PIPING, WHETHER LAGGED OR NOT, MAY CREATE SUPERFICIAL SURFACE IRREGULARITIES, MAKING IT DIFFICULT TO OBTAIN VALID READINGS, EVEN FOR UT METERS DESIGNED TO READ THROUGH PAINT, IN WHICH CASE CHIPPING AND/OR WIREBRUSHING OF THE PAINT MAY BE REQUIRED TO OBTAIN VALID READINGS.

LP STEAM DRAIN – FORWARD MACHINERY ROOM

USS SAIPAN (LHA-2)

(VISIT DATES 20 FEB TO 9 MAR, 2001)

MATERIAL OF PIPE IS COPPER NICKEL

UT #	SIZE	12	3	6	9	VIEW
1	3	0.095	0.095	0.100	0.100	A
2	3	0.100	0.090	0.100	0.100	A
3	3	0.095	0.090	0.100	0.100	A
4	3	0.110	0.110	0.110	0.110	A
5	3	0.110	0.110	0.110	0.110	A
6	3	0.110	0.110	0.110	0.110	A
7	3	0.110	0.110	0.110	0.110	A
8	3	0.110	0.110	0.110	0.110	A
9	3	0.110	0.110	0.110	0.110	A
10	3	0.110	0.110	0.110	0.110	A
11	3	0.075	0.075	0.080	0.080	B
12	3	0.080	0.080	0.075	0.080	B
13	3	0.075	0.070	0.080	0.080	B
14	3	0.080	0.075	0.075	0.075	B
15	3	0.070	0.070	0.080	0.080	B
16	1-1/2	0.070	0.070	0.070	0.070	A
17	3	0.070	0.075	0.075	0.075	B
18	3	0.075	0.075	0.075	0.075	B
19	3	0.075	0.075	0.075	0.070	B
20	3	0.080	0.075	0.070	0.080	B

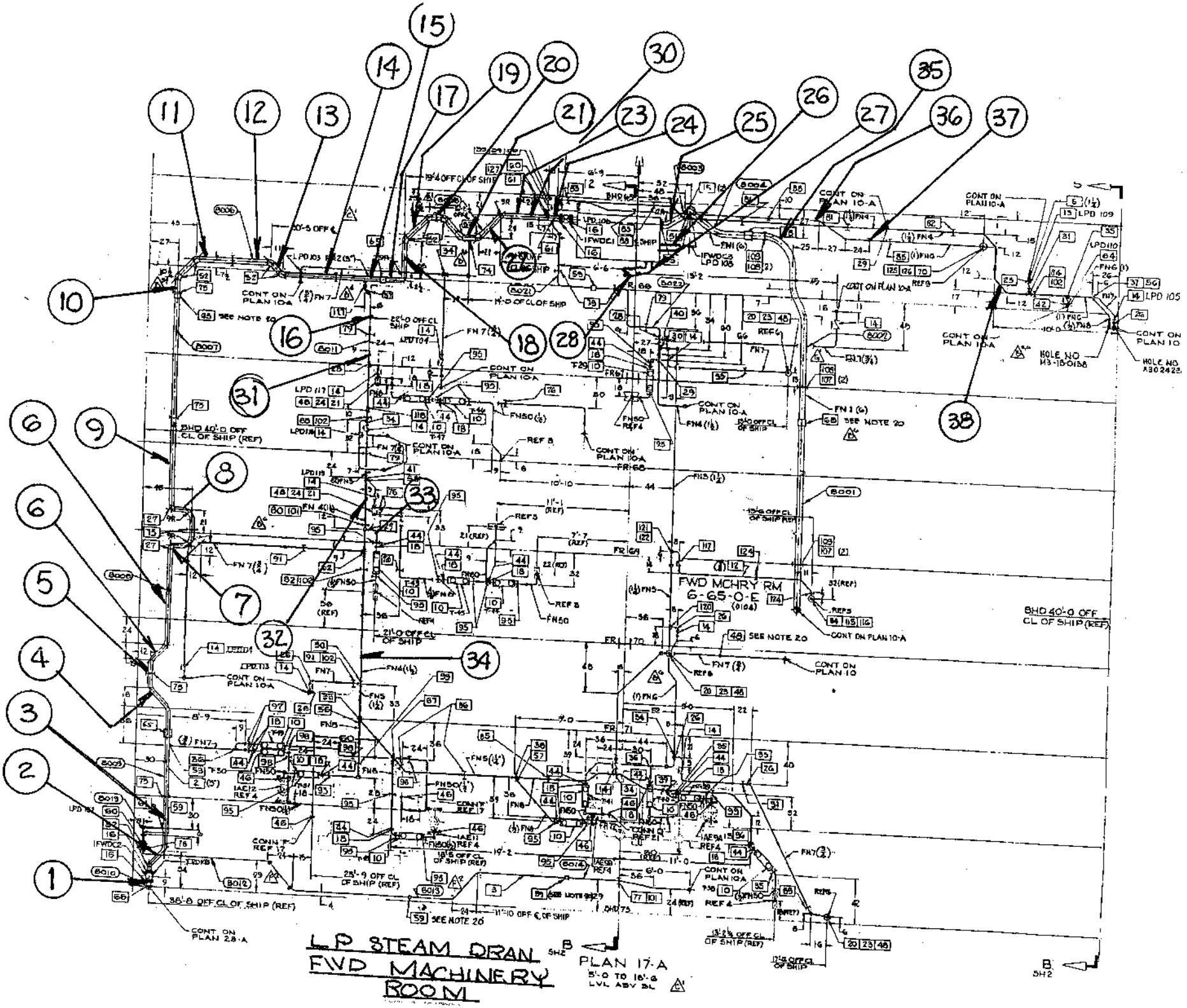
UT #	SIZE	12	3	6	9	VIEW
21	3	0.070	0.070	0.075	0.075	B
22	3	0.075	0.080	0.080	0.075	B
23	3	NOTE 1	0.070	0.070	0.075	B
24	3	NOTE 1	NOTE 1	0.075	NOTE 1	B
25	6	0.160	0.150	0.155	0.160	B
26	2	0.080	0.070	NOTE 1	NOTE 1	B
27	4	0.090	0.085	NOTE 1	NOTE 1	A
28	4	0.080	NOTE 1	NOTE 1	NOTE 1	B
29	2	0.065	0.080	NOTE 1	0.070	A
30	2	0.065	NOTE 1	NOTE 1	NOTE 1	A
31	2	0.080	NOTE 1	0.075	0.075	A
32	2	0.070	0.070	0.070	0.070	A
33	1	0.070	0.070	NOTE 1	0.070	A
34	1-3/4	0.070	0.075	NOTE 1	0.070	A
35	1-1/2	0.070	NOTE 1	0.070	NOTE 1	B
36	1-1/2	0.070	NOTE 1	NOTE 1	NOTE 1	B
37	1-1/2	0.075	0.070	0.075	NOTE 1	B
38	1-1/2	0.070	0.070	0.070	0.070	B
39						
40						

NOTE 1: DUE TO SURFACE IRREGULARITES, UNABLE TO OBTAIN ACCURATE U/T READING.

NOTE 2: DUE TO LOCATION OF PIPE, UNABLE TO OBTAIN U/T READING.

NOTE 3: DUE TO CLOSE PROXIMITY OF PIPE FITTINGS, UNABLE TO OBTAIN U/T READING.

NOTE 4: VIEW A = PIPING RUNNING FORE AND AFT (TOP OF PIPING IS 12 O'CLOCK).
VIEW B = PIPING RUNNING UP AND DOWN (12 O'CLOCK IS FORWARD POINT OF PIPE).
VIEW C = PIPING RUNNING PORT AND STARBOARD (TOP OF PIPING IS 12 O'CLOCK AND 3 O'CLOCK IS FORWARD).


FWD MCHRY RM
6-65-0-E
(0104)
LP STEAM DRAN
FWD MACHINERY
ROOM
PLAN 17-A
5'-0 TO 16'-6
LVL ABV BL
CONT ON PLAN 10-A
CONT ON PLAN 10
CONT ON PLAN 2B-A
SEE NOTE 20
SEE NOTE 26
BHD 40'-0 OFF CL OF SHIP (REF)
HOLE NO M3-16-0158
HOLE NO A302422

LP STEAM DRAIN – AFT MACHINERY ROOM

USS SAIPAN (LHA-2)

(VISIT DATES 20 FEB TO 9 MAR, 2001)

MATERIAL OF PIPE IS COPPER NICKEL

UT #	SIZE	12	3	6	9	VIEW
1	6	NR (CASTING)				A
2	6	0.180	0.175	0.190	0.180	A
3	6	0.180	0.165	0.185	0.190	A
4	–	–	–	–	–	–
5	3	0.095	0.090	0.095	0.100	A
6		(INACCESSIBLE)				
7	3	0.100	0.100	0.095	0.090	A
8	3	0.100	0.100	0.090	0.100	A
9	2-1/2	0.070	0.075	0.075	0.070	B
10	2-1/2	0.070	0.070	0.080	0.070	B
11	2-1/2	0.075	0.070	0.070	0.080	B
12	–	–	–	–	–	–
13	6	0.175	0.165	0.195	0.190	A
14	6	0.170	0.190	0.185	0.170	A
15	3	0.095	0.090	0.095	0.100	A
16	3	0.080	0.065	0.080	0.090	A
17	1	0.075	0.075	0.070	0.075	A
18	1	0.070	0.075	0.075	0.070	A
19	3	0.100	0.095	0.095	0.100	A
20	3	0.080	0.070	0.080	0.080	A

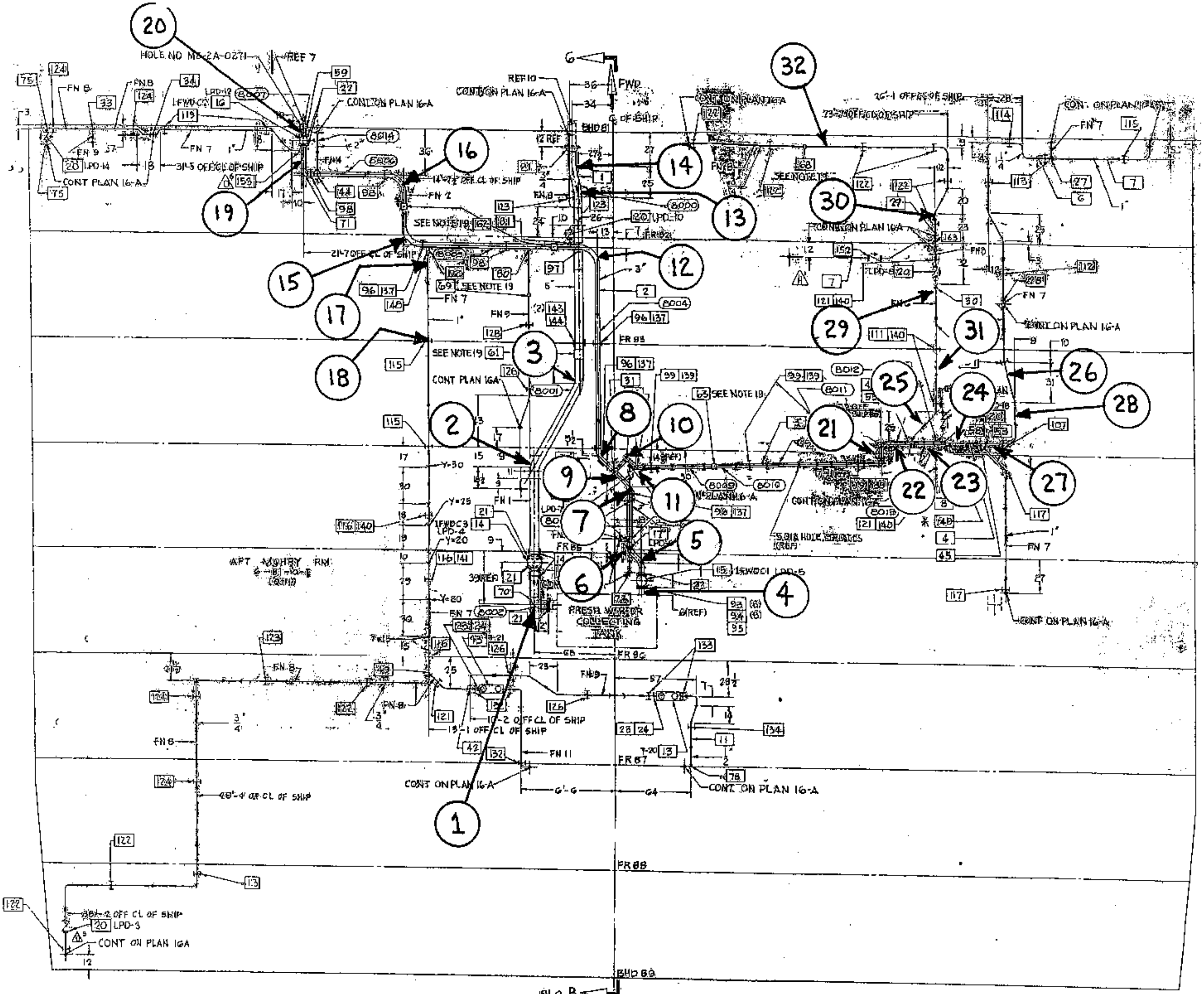
UT #	SIZE	12	3	6	9	VIEW
21	2-1/2	0.075	0.075	0.075	0.070	A
22	2-1/2	0.075	0.070	0.075	0.075	B
23	2-1/2	0.070	0.075	0.080	0.070	B
24	2	0.075	0.075	0.075	0.070	B
25	1-1/4	0.070	0.070	0.075	0.070	B
26	1-1/4	0.075	0.075	0.070	0.070	A
27	1-1/2	0.070	0.070	0.070	0.070	A
28	1-1/2	0.080	0.075	0.070	0.075	A
29	1-1/4	0.070	0.070	0.070	0.070	A
30	1	0.075	0.070	0.075	0.075	A
31	1-1/2	0.070	0.070	0.075	0.070	A
32	3/4	0.075	0.070	0.070	0.070	A
33						
34						
35						
36						
37						
38						
39						
40						

NOTE 1: DUE TO SURFACE IRREGULARITES, UNABLE TO OBTAIN ACCURATE U/T READING.

NOTE 2: DUE TO LOCATION OF PIPE, UNABLE TO OBTAIN U/T READING.

NOTE 3: DUE TO CLOSE PROXIMITY OF PIPE FITTINGS, UNABLE TO OBTAIN U/T READING.

NOTE 4: VIEW A = PIPING RUNNING FORE AND AFT (TOP OF PIPING IS 12 O'CLOCK).
VIEW B = PIPING RUNNING UP AND DOWN (12 O'CLOCK IS FORWARD POINT OF PIPE).
VIEW C = PIPING RUNNING PORT AND STARBOARD (TOP OF PIPING IS 12 O'CLOCK AND 3 O'CLOCK IS FORWARD).



LP STEAM DRAIN

PLAN VIEW

HP STEAM DRAIN – FORWARD MACHINERY ROOM

USS SAIPAN (LHA-2)

(VISIT DATES 20 FEB TO 9 MAR, 2001)

MATERIAL OF PIPE IS COPPER NICKEL

UT #	SIZE	12	3	6	9	VIEW
1	1/2	0.160	0.160	0.160	0.160	B
2	1/2	NOTE 1	NOTE 1	0.140	0.140	C
3	1/2	0.160	0.155	0.150	0.160	C
4	3/4	0.150	0.140	0.150	0.160	B
5	3/4	0.150	0.150	0.150	0.150	B
6	1-3/4	0.210	0.210	0.210	0.210	B
7	1-3/4	0.180	0.205	0.210	0.190	A
8	1-3/4	0.210	0.190	0.190	0.225	A
9	3/4	0.160	0.150	0.140	0.155	A
10	3/4	0.155	0.160	0.150	0.150	A
11	3/4	0.150	NOTE 1	NOTE 1	0.150	A
12	1/2	0.120	NOTE 1	NOTE 1	0.120	B
13	1/2	0.120	0.130	0.130	0.115	B
14	3/4	0.150	0.140	0.140	0.155	B
15	3/4	0.150	0.160	0.150	0.150	A
16	1/2	0.110	0.125	0.110	0.110	A
17	3/4	0.160	0.145	0.135	0.140	A
18	3/4	0.150	NOTE 1	NOTE 1	0.135	A
19						
20						

UT #	SIZE	12	3	6	9	VIEW
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
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NOTE 1: DUE TO SURFACE IRREGULARITES, UNABLE TO OBTAIN ACCURATE U/T READING.

NOTE 2: DUE TO LOCATION OF PIPE, UNABLE TO OBTAIN U/T READING.

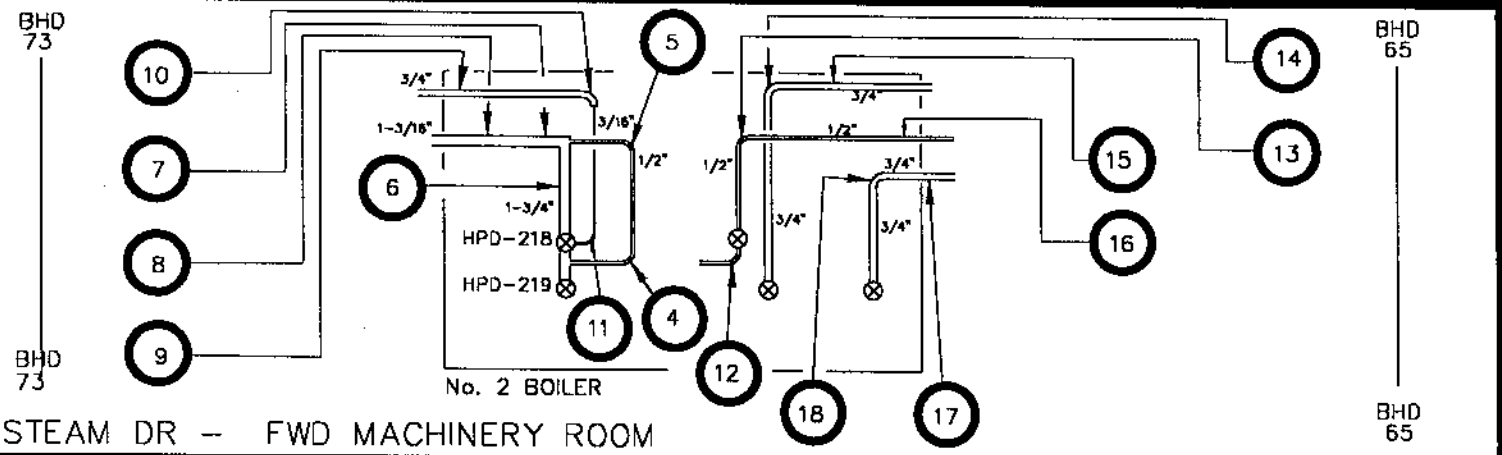
NOTE 3: DUE TO CLOSE PROXIMITY OF PIPE FITTINGS, UNABLE TO OBTAIN U/T READING.

NOTE 4: VIEW A = PIPING RUNNING FORE AND AFT (TOP OF PIPING IS 12 O'CLOCK).
VIEW B = PIPING RUNNING UP AND DOWN (12 O'CLOCK IS FORWARD POINT OF PIPE).
VIEW C = PIPING RUNNING PORT AND STARBOARD (TOP OF PIPING IS 12 O'CLOCK AND 3 O'CLOCK IS FORWARD).

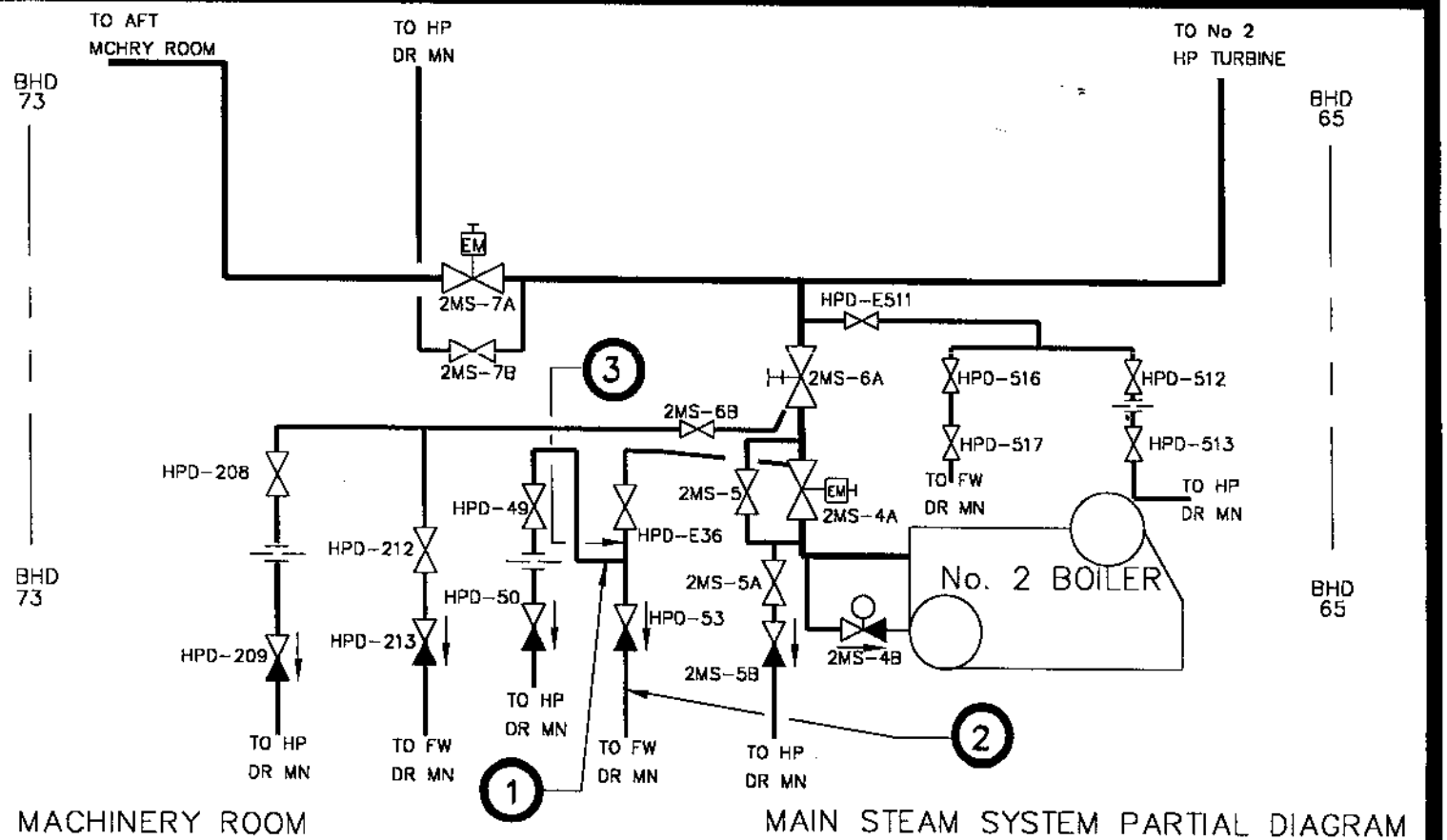
DIAGRAM – HP STEAM DRAIN – FWD MACHINERY ROOM

USS SAIPAN (LHA-2)

(VISIT DATES 20 FEB TO 9 MAR, 2001)



HP STEAM DR – FWD MACHINERY ROOM



FWD MACHINERY ROOM

MAIN STEAM SYSTEM PARTIAL DIAGRAM

LEGEND

- STOP VALVE
- STOP CHECK VALVE
- STOP CHK VLV LOCKED OPEN
- STOP CHK VLV OPERATED LOCAL/ REMOTE IN SAME SPACE
- STOP VALVE, ELEC MOTOR OPERATED MANUAL OVERIDE
- ORIFACE
- 1 UT SAMPLE POINT (TYP)

HP	HIGH PRESSURE
FW	FRESH WATER
DR	DRAIN
MN	MAIN

HP STEAM DRAIN – AFT MACHINERY ROOM

USS SAIPAN (LHA-2)

(VISIT DATES 20 FEB TO 9 MAR, 2001)

MATERIAL OF PIPE IS STEEL

UT #	SIZE	12	3	6	9	VIEW
1	1/2	0.135	NOTE 1	NOTE 1	0.140	B
2	1/2	0.155	NOTE 1	NOTE 1	0.160	B
3	1/2	NOTE 1	0.160	0.160	NOTE 1	B
4	1/2	0.155	0.145	NOTE 1	0.160	B
5	1/2	0.145	NOTE 1	NOTE 1	0.140	B
6	1/2	0.160	0.155	NOTE 1	NOTE 1	B
7	1/2	0.135	0.145	0.145	0.140	B
8	1/2	0.160	NOTE 1	NOTE 1	0.155	B
9	1/2	NOTE 1	0.155	NOTE 1	0.160	B
10	1/2	0.160	NOTE 1	0.155	NOTE 1	B
11	1/2	0.155	NOTE 1	NOTE 1	NOTE 1	B
12	1/2	0.155	NOTE 1	0.150	NOTE 1	B
13	1/2	0.150	NOTE 1	NOTE 1	NOTE 1	B
14	–	–	–	–	–	–
15	1/2	0.160	0.155	0.155	NOTE 1	B
16	1/2	0.155	0.160	0.155	NOTE 1	B
17	1/2	0.155	0.155	0.155	0.160	B
18	1/2	0.155	NOTE 1	NOTE 1	NOTE 1	A
19	1/2	0.160	NOTE 1	NOTE 1	NOTE 1	A
20	1/2	0.155	0.150	0.145	0.150	A

UT #	SIZE	12	3	6	9	VIEW
21	1/2	0.145	0.140	0.140	0.155	B
22	1/2	NOTE 1	0.145	NOTE 1	NOTE 1	B
23	1/2	0.145	0.140	0.140	0.145	B
24	1/2	0.160	0.160	0.150	0.140	A
25	1/2	0.145	0.140	0.150	0.150	A
26	1/2	0.140	0.140	0.140	0.140	A
27	1/2	0.145	NOTE 1	NOTE 1	NOTE 1	A
28	1/2	NOTE 1	0.160	NOTE 1	0.150	A
29	1/2	0.155	0.155	NOTE 1	0.160	A
30	1/2	0.140	0.125	0.130	NOTE 1	A
31	1/2	0.160	NOTE 1	NOTE 1	NOTE 1	A
32	1/2	0.155	0.155	0.155	0.160	A
33	1/2	NOTE 1	NOTE 1	0.155	NOTE 1	A
34						
35						
36						
37						
38						
39						
40						

NOTE 1: DUE TO SURFACE IRREGULARITES, UNABLE TO OBTAIN ACCURATE U/T READING.

NOTE 2: DUE TO LOCATION OF PIPE, UNABLE TO OBTAIN U/T READING.

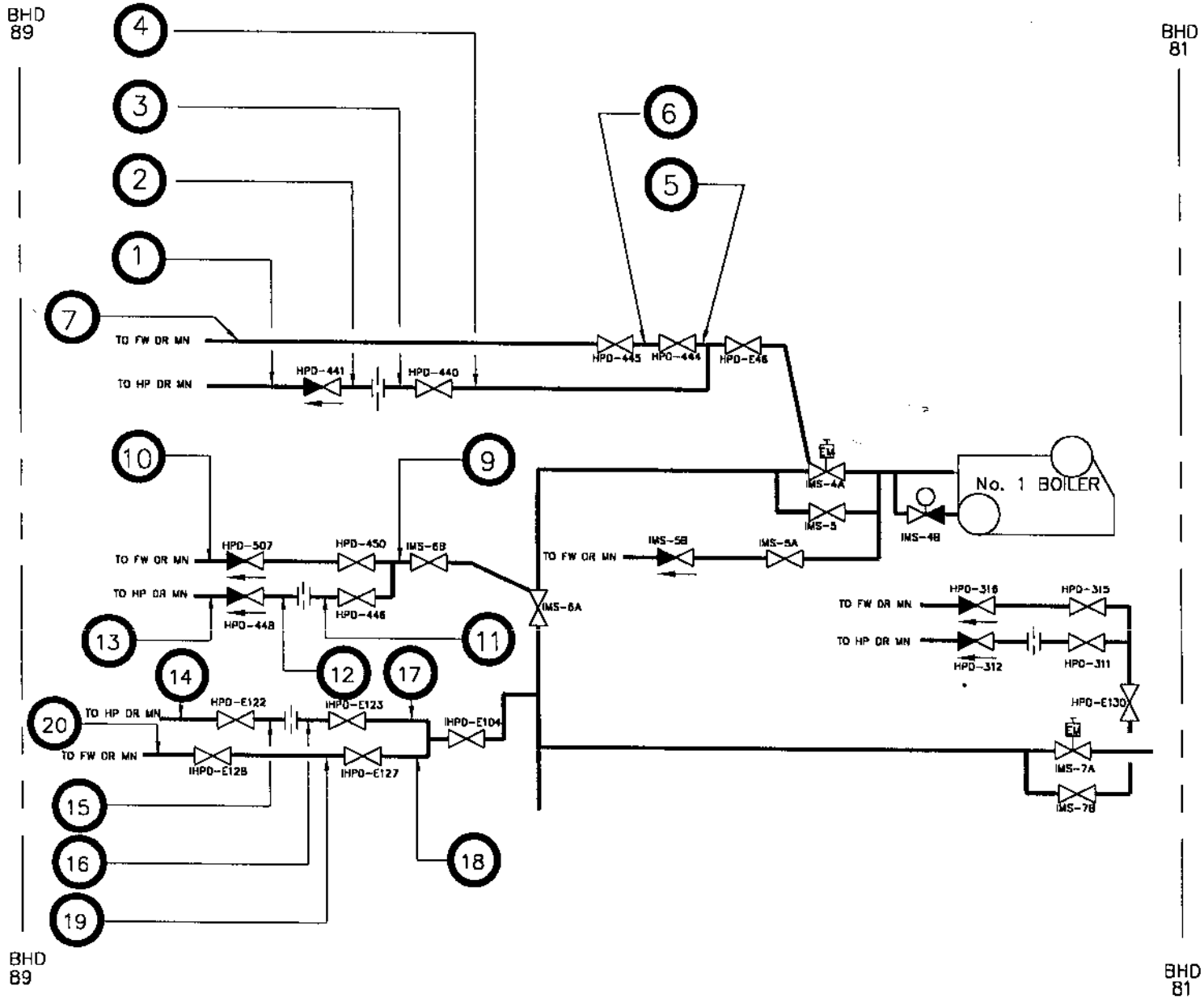
NOTE 3: DUE TO CLOSE PROXIMITY OF PIPE FITTINGS, UNABLE TO OBTAIN U/T READING.

NOTE 4: VIEW A = PIPING RUNNING FORE AND AFT (TOP OF PIPING IS 12 O'CLOCK).
VIEW B = PIPING RUNNING UP AND DOWN (12 O'CLOCK IS FORWARD POINT OF PIPE).
VIEW C = PIPING RUNNING PORT AND STARBOARD (TOP OF PIPING IS 12 O'CLOCK AND 3 O'CLOCK IS FORWARD).

DIAGRAM – HP STEAM DRAIN – AFT MACHINERY ROOM

USS SAIPAN (LHA-2)

(VISIT DATES 20 FEB TO 9 MAR, 2001)



AFT MACHINERY ROOM

MAIN STEAM SYSTEM PARTIAL DIAGRAM

LEGEND

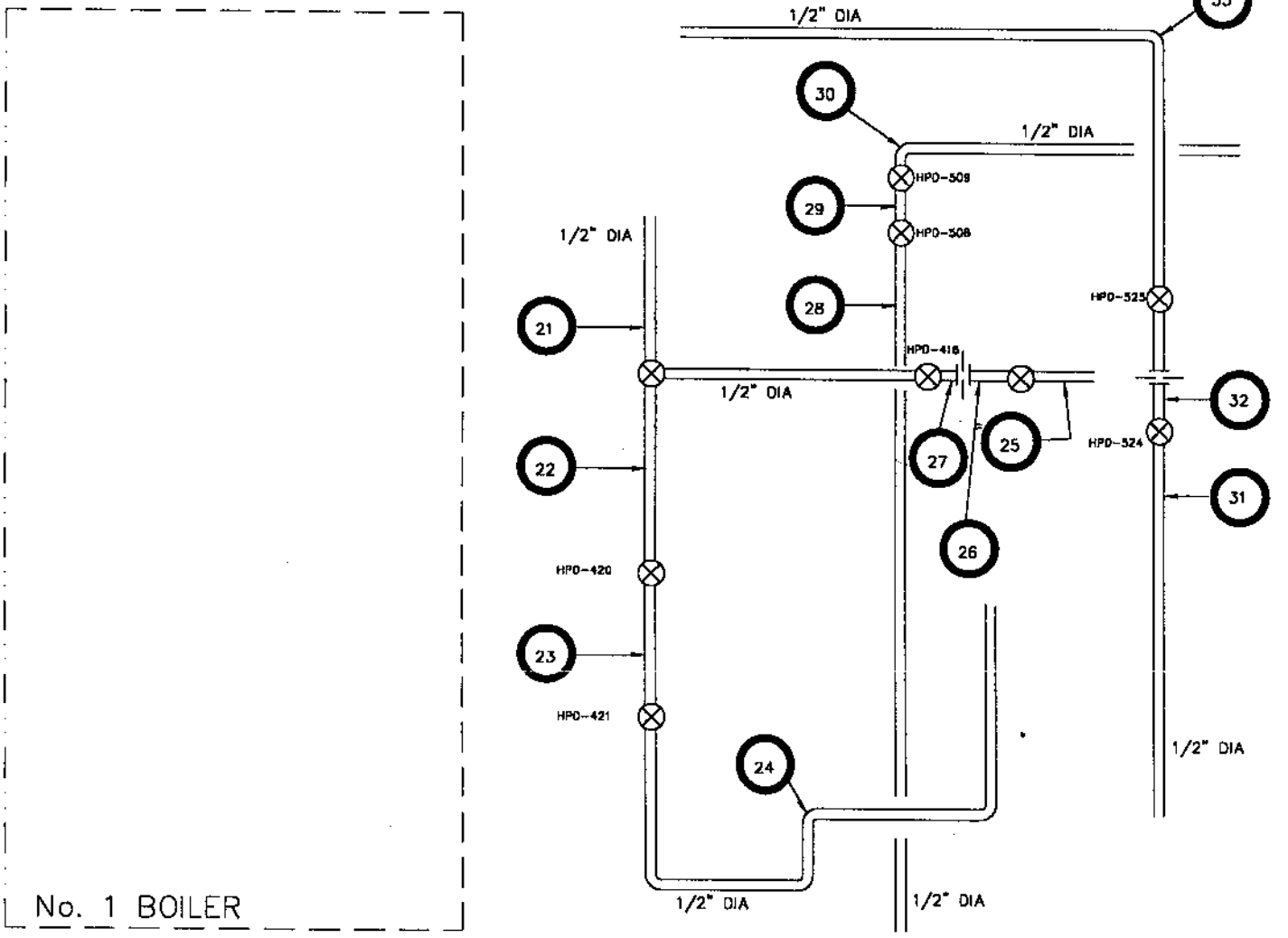
- STOP VALVE
- STOP CHECK VALVE
- STOP CHK VLV LOCKED OPEN
- STOP CHK VLV OPERATED LOCAL/ REMOTE IN SAME SPACE
- STOP VALVE, ELEC MOTOR OPERATED MANUAL OVERIDE
- ORIFACE
- 1 UT SAMPLE POINT (TYP)

HP	HIGH PRESSURE
FW	FRESH WATER
DR	DRAIN
MN	MAIN

DIAGRAM – HP STEAM DRAIN – AFT MACHINERY ROOM

USS SAIPAN (LHA–2)

(VISIT DATES 20 FEB TO 9 MAR, 2001)



LEGEND

- STOP VALVE
- STOP CHECK VALVE
- STOP CHK VLV LOCKED OPEN
- STOP CHK VLV OPERATED LOCAL/ REMOTE IN SAME SPACE
- ASTERN THROTTLE VALVE
- STOP VALVE, ELEC MOTOR OPERATED MANUAL OVERIDE
- S — MAIN STEAM STRAINER
- ORIFACE

HP	HIGH PRESSURE
FW	FRESH WATER
DR	DRAIN
MN	MAIN
SSTG	SHIP SERVICE TURBOGENERATOR

HP STEAM DR – AFT MACHINERY ROOM

PIPES AT 5' LEVEL

LUBE OIL – FORWARD MACHINERY ROOM

USS SAIPAN (LHA-2)

(VISIT DATES 20 FEB TO 9 MAR, 2001)

MATERIAL OF PIPE IS STEEL

UT #	SIZE	12	3	6	9	VIEW
1	1-1/2	0.140	0.140	0.135	0.130	A
2	1-1/2	0.140	0.135	0.140	0.140	A
3	1-1/2	0.140	0.130	0.140	0.140	C
4	1-1/2	0.130	0.135	0.140	0.145	C
5	1-1/2	0.145	0.140	0.140	0.140	C
6	1-1/2	0.140	0.145	0.140	0.140	C
7	1-1/2	0.135	0.140	0.130	0.140	C
8	1-1/2	0.140	0.140	NOTE 1	NOTE 1	B
9	1-3/4 & 2	0.215	0.235	NOTE 1	0.230	B
10	3/4	0.120	0.120	NOTE 1	0.120	B
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

UT #	SIZE	12	3	6	9	VIEW
21						
22						
23						
24						
25						
26						
27						
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NOTE 1: DUE TO SURFACE IRREGULARITES, UNABLE TO OBTAIN ACCURATE U/T READING.

NOTE 2: DUE TO LOCATION OF PIPE, UNABLE TO OBTAIN U/T READING.

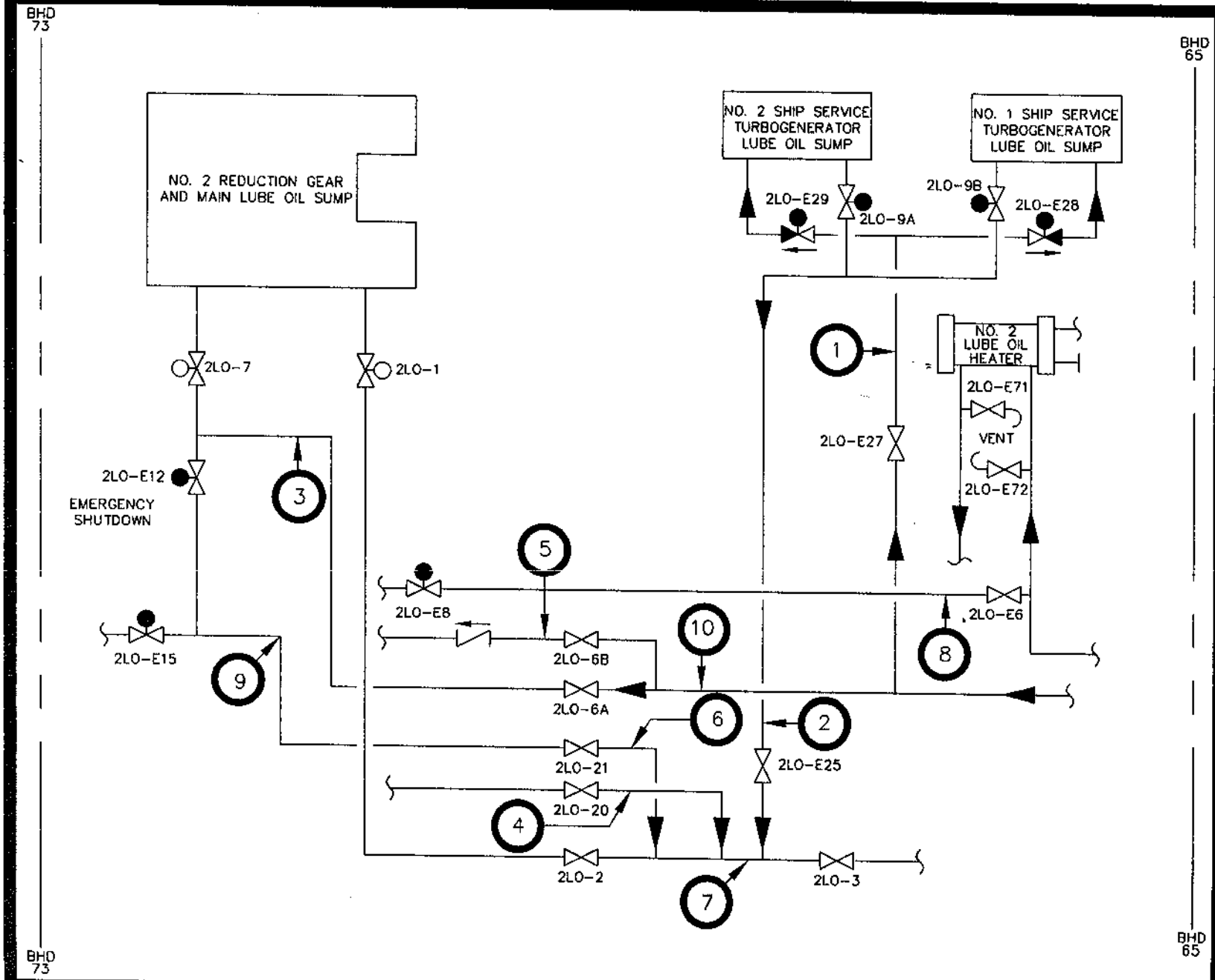
NOTE 3: DUE TO CLOSE PROXIMITY OF PIPE FITTINGS, UNABLE TO OBTAIN U/T READING.

NOTE 4: VIEW A = PIPING RUNNING FORE AND AFT (TOP OF PIPING IS 12 O'CLOCK).
VIEW B = PIPING RUNNING UP AND DOWN (12 O'CLOCK IS FORWARD POINT OF PIPE).
VIEW C = PIPING RUNNING PORT AND STARBOARD (TOP OF PIPING IS 12 O'CLOCK AND 3 O'CLOCK IS FORWARD).

DIAGRAM – LUBE OIL – FWD MACHINERY ROOM

USS SAIPAN (LHA–2)

(VISIT DATES 20 FEB TO 9 MAR, 2001)



LEGEND

- STOP VALVE
- STOP VALVE LOCKED OPEN
- STOP VALVE LOCKED SHUT
- STOP CHECK VALVE
- STOP CHECK VALVE, LOCKED SHUT
- SWING CHECK VALVE
- (1) UT SAMPLE POINT (TYP)

USS SAIPAN (LHA-2)

LUBE OIL FWD MACHINERY RM

VISIT DATES 20 FEB 01 TO 09 MAR 01

MATERIAL :- STEEL

UT #	SIZE	12	3	6	9	VIEW
1	1 1/2	.140	.140	.135	.130	(A) B C
2	1 1/2	.140	.135	.140	.140	(A) B C
3	1 1/2	.140	.130	.140	.140	A B (C)
4	1 1/2	.130	.135	.140	.145	A B (C)
5	1 1/2	.145	.140	.140	.140	A B (C)
6	1 1/2	.140	.145	.140	.140	A B (C)
7	1 1/2	.135	.140	.130	.140	A B (C)
8	1 1/2	.140	.140	NOTE 1	NOTE 1	A (B) C
9	13/4 1/2	.215	.285	NOTE 1	.230	A (B) C
10	3/4	.120	.120	NOTE 1	.120	A (B) C
11						A B C
12						A B C
13						A B C
14						A B C
15						A B C
16						A B C
17						A B C
18						A B C
19						A B C
20						A B C

UT #	SIZE	12	3	6	9	VIEW
21						A B C
22						A B C
23						A B C
24						A B C
25						A B C
26						A B C
27						A B C
28						A B C
29						A B C
30						A B C
31						A B C
32						A B C
33						A B C
34						A B C
35						A B C
36						A B C
37						A B C
38						A B C
39						A B C
40						A B C

NOTE 1: DUE TO SURFACE IRREGULARITIES UNABLE TO OBTAIN ACCURATE U/T READINGS.
NOTE 2: DUE TO LOCATION OF THE PIPE UNABLE TO OBTAIN U/T READINGS.
NOTE 3: DUE TO CLOSE PROXIMITY OF PIPE FITTINGS UNABLE TO OBTAIN U/T READINGS.
NOTE 4: VIEW A = PIPING RUNNING FORE AND AFT TOP OF PPG IS 12 O'CLOCK; VIEW B = PIPING RUNNING UP AND DOWN 12 O'CLOCK IS FORWARD;VIEW C = PIPING RUNNING PORT AND STBD 12 O'CLOCK IS TOP, 3 O'CLOCK IS FORWARD.

DIAGRAM – LUBE OIL – AFT MACHINERY ROOM

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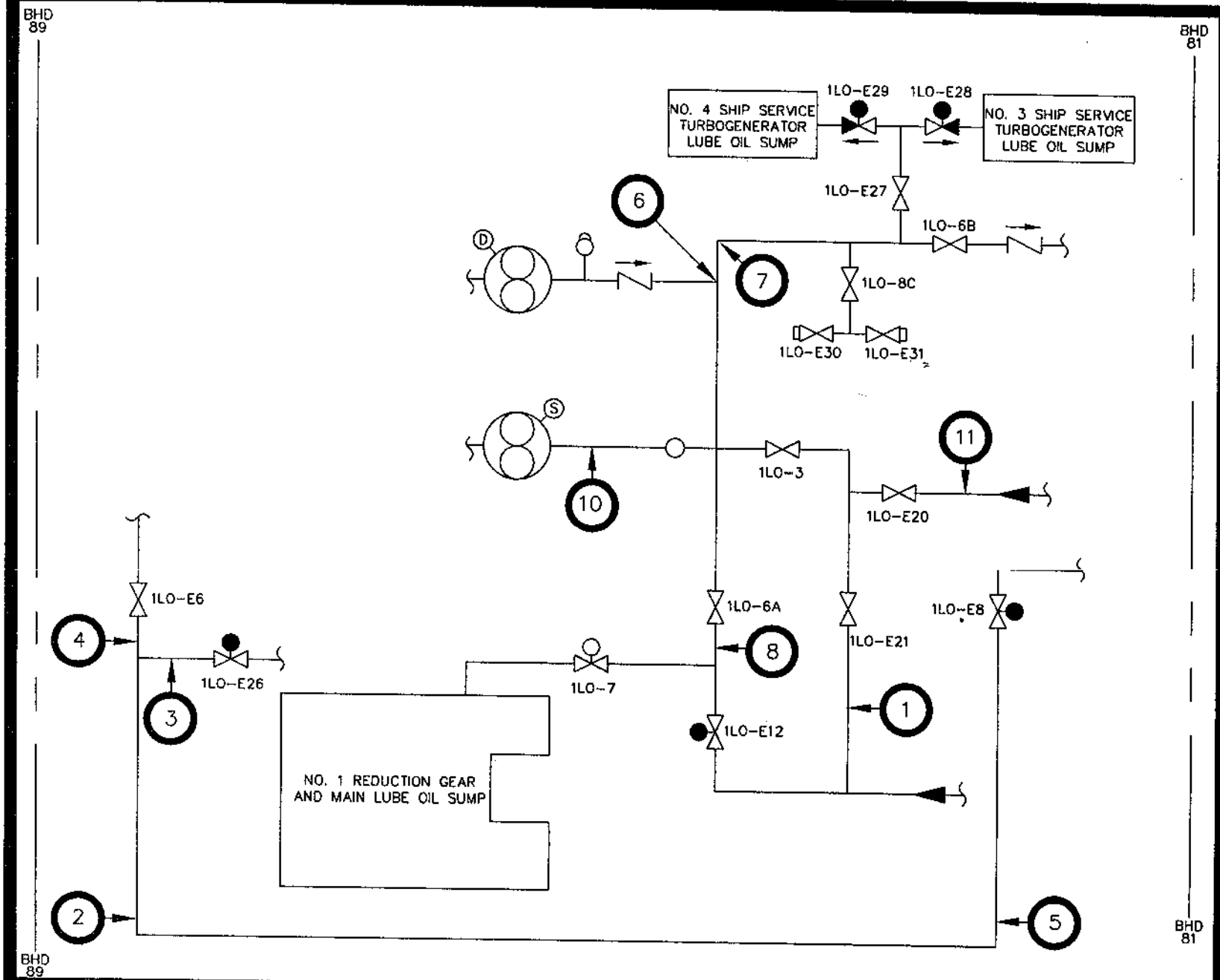

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SHIP SYSTEM	SUBSYSTEM	MRC CODE
Shipboard Piping Systems		R-

SYSTEM	EQUIPMENT	RATES	M/H
	System Piping	GS-11/12	24.0

MAINTENANCE REQUIREMENT DESCRIPTION

1. Conduct TARGET assessment procedure for ultrasonic testing of piping systems.

TOTAL M/H
24.0
ELAPSED TIME

SAFETY PRECAUTIONS

1. Forces afloat comply with NAVOSH Program Manual for Forces Afloat, OPNAVINST 5100.19 series.

TOOLS, PARTS, MATERIALS, TEST EQUIPMENT

TEST EQUIPMENT

1. Ultrasonic test meter

MATERIALS

1. [1749] Lubricating compound, silicone Hazardous Material User's Guide (HMUG) Group 11, Disposal Method 1

TOOLS

1. [0196] Brush, wire, scratch, Carbon steel, 14-1/2"
2. [0611] Hammer, hand, Scaling, 1 LB
3. [0721] Knife, pocket, Electricians
4. [2271] Flashlight, Type 3, style 1, explosive proof
5. [2384] Tape, measuring, 1/2" steel, 72", push-pull rewind

MISCELLANEOUS

1. [1365] NSTM Chapter 505
2. System UT plans or System EOSS diagram
3. Teflon probe covers

NOTE: Numbers in brackets can be referenced to Standard PMS Materials Identification Guide (SPMIG) for stock number identification.

PROCEDURE

NOTE 1: Total man-hours listed are for accomplishment per system based on a DD class ship. Number of personnel and total man-hours may require adjustment on other class ships.

NOTE 2: Accomplish either before availability, after availability, or before deployment.

LOCATION	DATE
	August 1997

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HAZARDOUS MATERIALS CONTROL STATEMENT (U)

The Hazardous Material Users Guide (HMUG), OPNAV P-45-110-91, provides additional control measures, precautions, personal protective equipment (PPE), and spill controls for the hazardous material(s) identified in the Tools, Parts, Materials, Test Equipment block.

PROCEDURE (Contd)

NOTE 3: Ultrasonic testing shall be accomplished on sections of the piping system located on 2nd Deck and below in the following locations:

a. All elbows, tees and bends. (Special attention shall be given to the outside radius).
b. Piping low points.
c. Areas requested to be surveyed by Port Engineer or ship's CHENG.

NOTE 4: The minimum allowable wall thickness for any piping system shall not be less than .050 inch as per NSTM section 505.

NOTE 5: Do not take UT readings on sil-brazed fittings. Sil-brazed fitting materials are porous and will not provide true readings.

NOTE 6: When conducting UT assessment of steam system piping or other high temperature systems, use teflon style probe covers with silicon lubricant. UT assessment of high temperature systems is best accomplished when system has been inactive for 8 hrs.

CAUTION: Those personnel who are in contact with wastewater, or assess wastewater treatment plants, should keep basic immunizations current. Immunizations required include typhoid, polio, and tetanus.

CAUTION: Personnel shall exercise extreme care when performing UT assessments on active steam piping and other high temperature systems.

1. **Conduct TARGET Assessment Procedure for Ultrasonic Testing of Piping Systems.**
   a. Prepare the pipe or tube to be assessed by removing all rust, scale, and paint to produce a moderately bright metal surface. (On insulated/lagged piping, use a utility knife to cut a triangular flap in the insulation/lagging in the area to be tested. Upon completion of testing in that area, reinsert the flap back into place.)
   b. Calibrate the ultrasonic test meter. The meter shall be calibrated to read within .005 inch of the test block thickness.

PROCEDURE (Contd)

c. Take one reading at the bottom of piping/tubing. Where applicable, a second reading at a 90° interval around the circumference of the pipe shall be taken on the outside radius where flow is turbulent. When flow through a tee is supplied from the center run and discharges through either branch, readings shall be taken at the bottom and the back end of the tee (the wall of the tee that the flow discharges against).

d. Record all readings taken on UT plans or EOSS diagrams at the location where the readings were taken.

e. Compare recorded readings against the minimum allowable wall thickness values indicated in UT Piping Data Tables. When readings are at or below the minimum allowable wall thickness values indicated in the tables, or if marginal readings that may drop below the minimum prior to the next scheduled overhaul are indicated, continue surveying along the run of piping until satisfactory readings are indicated on both sides of the deteriorated sections. Measure and record the length and location of the deteriorated sections, as well as the size and material of the pipe. Report all discrepancies identified on applicable TARGET discrepancy reporting forms (2-K or Material Assessment Form).

f. At the completion of the system survey, the lowest recorded reading at each test point shall be recorded onto two (2) clean plans/diagrams. One shall be turned in with the system test report and the other shall be retained for analysis.

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PROCEDURE (Contd)

UT PIPING DATA TABLES

NOTE:

1. The Design thickness listed is for reference purposes only. This figure will vary between classes and between ships within a class. The min wall thickness listed has been calculated based on NSTM section 505 requirements.
2. Some classes may use carbon steel for Fuel Oil systems. The min wall thicknesses listed for CRES apply.
3. The minimum allowable wall thickness for copper tubing 4" and below is .050".

FUEL OIL FILL AND TRANSFER SYSTEM				
NOM PIPE SIZE	CUT DIA	MATERIAL	DES THKNESS	MIN THKNESS *
10"	10.75	CRES	.365	.057
8"	8.625	CRES	.322	.050
6"	6.625	CRES	.280	.050
6"	6.625	CU/NI 70/30	.134	.055
5"	5.563	CRES	.258	.050
5"	5.563	CU/NI 70/30	.125	.050
4"	4.500	CRES	.237	.050
4"	4.500	CU/NI 90/10	.109	.050
3"	3.500	CRES	.216	.050
2.5"	2.875	CRES	.203	.050
2.5"	2.875	CU/NI 70/30	.083	.050
2"	2.375	CRES	.154	.050
2"	2.375	CU/NI 90/10	.083	.050
1.5"	1.900	CU/NI 90/10	.072	.050
1.25"	1.660	CRES	.140	.050
1"	1.315	CRES	.133	.050

PROCEDURE (Contd)

BOTTOM BLOW PIPING				
NOM PIPE SIZE	CUT DIA	MATERIAL	DES THKNESS	MIN THKNESS
2"	2.375	CS	.343	.130
1"	1.315	NI/CU	.179	.115
.75"	1.050	NI/CU	.154	.115

AUX SW, CHT, MN DRAINAGE, JP-5 AND FIREMAIN SYS				
NOM PIPE SIZE	OUT DIA	MATERIAL	DES THKNESS	MIN THKNESS
8"	8.625	CU/NI 90/10	.148	.077
6"	6.625	CU/NI 90/10	.134	.059
5"	5.563	CU/NI 90/10	.125	.050
4"	4.500	CU/NI 90/10	.109	.050
3"	3.500	CU/NI 90/10	.095	.050
2.5"	2.875	CU/NI 90/10	.083	.050
2"	2.375	CU/NI 90/10	.083	.050
1.5"	1.900	CU/NI 90/10	.072	.050
1"	1.315	CU/NI 90/10	.065	.050

PROCEDURE (Contd)

DISPOSAL METHODS FOR HAZARDOUS MATERIAL/WASTE IDENTIFIED IN THE TOOLS, PARTS, MATERIAL, AND TEST EQUIPMENT BLOCK

Method 1: Containerize waste in original container, if possible, or use standard container as listed in Appendix B3-D of OPNAVINST 5100.19B, "Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat" and Naval Ships' Technical Manual (NTSM) S9086-T8-STM-010/CH-593, Pollution Control. Store in accordance with OPNAVINST 5100.19B and NSTM Chapter 670. Do not mix chlorinated solvents with nonchlorinated solvents. Mark, label, or tag the container, according to ship procedures, with specific contents and any information on the contaminants. This information must also be provided on DD Form 1348-1 at time of offloading.